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TO: Mail Stop APPEAL BRIEF - PATENTS

ATTACHED: - FEE SHEET (PTO/SB/17), in duplicate;

- APPEAL BRIEF (15 pages),

RESPONSE DUE: AUGUST 6, 2006

CUSTOMER NO.: 24498
Serial No.: 09/786,432
Docket No.: PF980059
Art Unit: 2613
Examiner: Anand Shashikant Rao

TOTAL NUMBER OF PAGES INCLUDING THIS SHEET: 18

This collection of information is required by 37 CFR 1.8. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.8 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND

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FEE TRANSMITTAL
for FY 2006

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

Complete if Known	
Application Number	09/786,432
Filing Date	March 5, 2001
First Named Inventor	Christophe Chevance
Examiner Name	Anand Shashikant Rao
Art Unit	2613
Attorney Docket No.	PF980059

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1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES	Small Entity	SEARCH FEES	Small Entity	EXAMINATION FEES	Small Entity	
Application Type	**Fee ($)**	**Fee ($)**	**Fee ($)**	**Fee ($)**	**Fee ($)**	**Fee ($)**	**Fees Paid ($)**
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Small Entity Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		Extra Claims	Fee ($)	Fee Paid ($)
_____	- 20 or HP =	_____	x _____	= _____

HP = highest number of total claims paid for, if greater than 20.

Independent Claims		Extra Claims	Fee ($)	Fee Paid ($)
_____	- 3 or HP =	_____	x _____	= _____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims	
Fee ($)	**Fee Paid ($)**
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
_____	- 100 =	_____	/ 50 =	_____ (round up to a whole number) x	_____	= _____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): **Fee for filing Appeal Brief**	$500.00

SUBMITTED BY

Name (Print/Type)	GUY H. ERIKSEN	*Registration No. (Attorney/Agent)*	41,736	*Telephone*	(609) 734-6807
Signature					July 13, 2006

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

CUSTOMER NO.: 24498

Serial No.: 09/786,432

PF980059

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

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Applicant	:	Christophe Chevance et al.
Serial No.	:	09/786,432
Filed	:	March 5, 2001
For	:	Method of Motion Estimation for Transmission Cost Reduction of Motion Vectors
Examiner	:	Anand Shashikant Rao
Art Unit	:	2613

APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

May It Please The Honorable Board:

Appellants appeal the Final Rejection, dated March 14, 2006, of Claims 1-4, 7 and 10-11 of the above-identified application. Please charge the $500.00 Appeal Brief fee, and any other fees that may be associated with the filing of this Brief to Deposit Account No. 07-0832. Attached is a single copy of this Brief.

Appellants do not request an oral hearing.

07/14/2006 TL0111 00000006 070832 09786432
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I. REAL PARTY IN INTEREST

The real party in interest of Application Serial No. 09/786,432 is the Assignee of record:

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F-92100 Boulogne Billancourt
France

II. RELATED APPEALS AND INTERFERENCES

There are currently, and have been, no related Appeals or Interferences regarding Application Serial No. 09/786,432.

III. STATUS OF THE CLAIMS

Claims 5, 6, 8, 9, 12 and 13 are indicated as allowable. Claims 1-4, 7 and 10-11 are rejected and the rejection of claims 1-4, 7 and 10-11 are appealed.

IV. STATUS OF AMENDMENTS

All amendments were entered and are reflected in the claims included in Appendix I.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 provides a method of movement estimation for a sequence of images. The method includes the segmentation of a current video image into image blocks (Figure 1; Page 3, lines 18-21). The movement estimation per image block between the current image and a previous image is accomplished in order to obtain a movement vector field for the current image (Figure 1; Page 3, line 22 – Page 4, line 4). A stage of reassignment of a vector to a block is achieved by selecting one movement vector from among N predominant vectors (Figure 2; Page 4, line 16 – Page 5, line 21). The predominant vectors are the ones of the group of vectors belonging to the movement vector field for the

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current image and at least to the movement vector field for a preceding image corresponding to a movement vector field between the preceding image and a further preceding image (Figure 4; Page 6, line 22 – Page 7, line 24). The vectors are scaled according to the temporal distance to which they correspond (Figure 3: Page 6, lines 1-21).

Dependant claim 2 includes the features of independent claim 1 along with the additional feature that for a predominant vector, second-order regional maxima are detected so as not to be taken into account during the selection of the other predominant vectors (Figure 1; Page 3, line 38 – Page 4, line 11).

Dependant claim 3 includes the features of independent claim 1 along with the additional feature that the predominant vectors are selected in each of four directions (Figure 1; Page 3, lines 31-37).

Dependant claim 4 includes the features of independent claim 1 along with the additional feature that the selection of the reassigned vector is based on the value of a displaced frame difference (DFD) (Figure 2; Page 4, lines 19-27).

Dependant claim 5 includes the features of independent claim 1 along with the additional feature that if the DFDs associated with the N predominant vectors are greater than the DFD associated with the original vector, a zero vector is adopted (Figure 2; Page 5, lines 3-6).

Dependant claim 6 includes the features of independent claim 1 along with the additional feature that if the DFDs associated with the N predominant vectors are greater

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than the weighted DFD associated with the original vector, the original vector is kept (Figure 2; Page 5, lines 27-29).

Dependant claim 7 includes the features of independent claim 1 along with the additional feature that the selection of the reassigned vector is based on the calculation of the activity (spatial gradient) in the inter-image difference block (current block -estimated block) (Figure 2; Page 5, lines 30-35).

Dependant claim 8 includes the features of independent claim 1 along with the additional feature that if the activities corresponding to the N predominant vectors are greater than the activity corresponding to the original vector, the zero vector is adopted (Figure 2; Page 5, lines 3-21).

Dependant claim 9 includes the features of independent claim 1 along with the additional feature that if the activities corresponding to the N predominant vectors are greater than the weighted activity corresponding to the original vector, the original vector is kept (Figure 2; Page 5, lines 30-35).

Dependant claim 10 includes the features of independent claim 1 along with the additional feature that the components of the vectors used during the DFD calculations are the spatially filtered components (Figure 3; Page 6, lines 5-21).

Dependant claim 11 includes the features of independent claim 1 along with the additional feature that the components of the vectors used during the spatial-gradient calculations are the spatially filtered components (Figure 3; Page 6, lines 5-21).

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Dependant claim 12 includes the features of independent claim 1 along with the additional feature that the vectors of the preceding images, in addition to being scaled, are weighted as a function of the temporal distance (Figure 4; Page 6, line 22 – Page 7, line 24).

Dependant claim 13 includes the features of independent claim 1 along with the additional feature that when a break in movement is detected, the vectors of the preceding images are not considered (Figure 4; Page 7, lines 7-9)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-4, 7 and 10-11 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Kerdranvrat in view of Lee.

VII. ARGUMENT

Kerdranvrat when taken alone or in any combination with Lee do not make the present claimed invention unpatentable. Thus, reversal of the Final Rejection (hereinafter termed "rejection") of claims 1-4, 7 and 10-11 under section 35 U.S.C. § 103(a) is respectfully requested.

Overview of the Cited References

Kerdranvrat recites a method of segmenting the field of motion of an image, particularly a video image, including forming a blockwise field of motion from motion vectors allocated to image pixels, processing the blockwise field of vectors in order to extract from this field a set of dominant vectors of motion, by elimination of the vectors close to the dominant vectors, so as to retain only representatives of widened classes of motion. Then a vector of the reduced set of dominant vectors is reassigned to each block, and the resulting field, after time filtering, is used for the encoding of the image by "quad-

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tree" encoding. This disclosed method applies in particular, to the setting-up of the coding-auxiliary digital data to the limit of 1 Mbt/s (see abstract).

Lee in an image encoding scheme (e.g., MPEG-2) in which two or more different sets of motion vectors are generated for each image that is to be encoded using motion estimation, one or more sets of motion vectors are generated by applying temporal scaling to one or more other sets of motion vectors that may be generated using conventional motion estimation techniques. Using such a temporal interpolation scheme to generate one or more of the sets of motion vectors for each image can greatly reduce the processing load on an image encoding system for motion estimation processing. Local motion estimation can optionally be performed on the estimates generated using temporal interpolation to select final motion vectors, e.g., for use in subsequent image compression processing that relies on motion compensation (see abstract).

Rejection of Claims 1-4, 7 and 10-11 under 35 USC 103(a)

over Kerdranvrat in view of Lee

Reversal of the rejection of claims 1-4, 7 and 10-11 under 35 U.S.C. 103(a) as being unpatentable over Kerdranvrat in view of Lee is respectfully requested because the rejection makes crucial errors in interpreting the cited reference. The rejection erroneously states that claims 1-4, 7 and 10-11 are made unpatentable by Kerdranvrat in view of Lee.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596, 1598 (Fed.Cir. 1988). In so doing, the Examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (CCPA 1966), and to provide a reason why one having ordinary skill in the

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pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion, or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. *Uniroya, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed.Cir. 1988), *cert. denied*, 488 U.S. 825 (1988); *Ashland Oil Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 28, 293, 227 USPQ 657, 664 (Fed.Cir. 1985), *cert. denied*, 475 U.S. 1017 (1986); *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed.Cir. 1984). These showings by the Examiner are an essential part of complying with the burden of presenting a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed.Cir. 1992).

CLAIMS 1-4, 7 and 10-11

Independent claim 1 provides a method of movement estimation for a sequence of images. The method includes the segmentation of a current video image into image blocks. The movement estimation per image block between the current image and a previous image is accomplished in order to obtain a movement vector field for the current image. A stage of reassignment of a vector to a block is achieved by selecting one movement vector from among N predominant vectors. The predominant vectors are the ones of the group of vectors belonging to the movement vector field for the current image and at least to the movement vector field for a preceding image corresponding to a movement vector field between the preceding image and a further preceding image. The vectors are scaled according to the temporal distance to which they correspond. These features are not shown (or suggested) by Kerdranvrat.

The present claimed invention reassigns a vector to a block. This reassignment is accomplished by selecting a motion vector from among the predominant motion vectors

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of the current image (the motion between the previous image and the current image) and the predominant motion vectors of the previous image (the motion between the previous image and the image preceding it).

Specifically, the present claimed invention provides "a stage of reassignment of a vector to a block by selecting one movement vector from among N predominant vectors, wherein the predominant vectors are the ones of the group of vectors belonging to the movement vector field for said current image and at least to the movement vector field for a preceding image". Accordingly, the present claimed invention selects one movement vector from among all the vectors belonging to the first and second motion vector fields. In contrast, Kerdranvrat describes a two step process wherein the first step of the process is to calculate a dominant motion vector for each motion vector field and store them in MEM1 and MEM2. Accordingly, Kerdranvrat describes selecting one dominant vector per movement vector field. Thus, Kerdranvrat is fundamentally different from the present claimed invention, as the present claimed invention selects a single vector **from among the two movement vector fields** and Kerdranvrat selects a dominant vector **from among a single movement vector field.**

Additionally, Kerdranvrat describes a second step wherein the dominant vectors calculated for each movement vector field of the current image are filtered by comparing the current dominant motion vectors to the previous dominant motion vectors and eliminating the current dominant motion vectors that are not in proximity to the previous dominant motion vectors. In contrast, the present claimed invention selects a vector from among all the motion vectors of the current movement vector field and the previous movement vector field. Thus, Kerdranvrat is fundamentally different than the present claimed invention, as the present claimed invention selects a vector **from among all the**

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motion vectors of the current movement vector field and the previous movement vector field and Kerdranvrat filter a motion vector **from among the dominant vectors** of the current movement vector field and the previous movement vector field.

Furthermore, the two step process described by Kerdranvrat produces resultant vectors which are a filtered comparison of the dominant vectors of the two fields. In effect, certain types of dominant motions are eliminated (Kerdranvrat; Col. 7, lines 25-36). In contrast, the present claimed invention selects a single vector from among all the motion vectors in two motion vector fields (i.e. using a single histogram). In effect, the predominant vectors for the two motion vector fields are calculated, taking into account the certain types of motions which are neglected by Kerdranvrat. Thus, the present claimed invention provides a more efficient process taking into account temporal correlation. Therefore, Kerdranvrat is fundamentally different from the present claimed invention, as the present claimed invention selects one movement vector from among the current movement vector field and the previous movement vector field and Kerdranvrat merely describes filtering the dominant motion vectors from the current motion vector field in relation to the dominant vectors from a previous motion vector field.

Even further, Lee discloses generating "five sets of motion vectors...for each frame that is to be encoded using motion estimation". In contrast, the present claimed invention selects one movement vector from among all the vectors belonging to the first and second motion vector fields. Thus, Lee is fundamentally different than the present claimed invention, as the present claimed invention **selects** a motion vector and Lee **generates** motion vectors. Additionally, Lee, similarly to Kerdranvrat, is fundamentally different than the present claimed invention, as the present claimed invention selects **one motion vector** and Lee generate **five sets of motion vectors**. Furthermore, Lee, similarly

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to Kerdranvrat, is fundamentally different than the present claimed invention, as the present claimed invention selects one movement vector **from among** vectors belonging to **the first and second motion vector fields** and Lee generates motion vectors for each **single vector field** (frame). Therefore, Lee, similarly to Kerdranvrat, neither discloses nor suggests "a stage of reassignment of a vector to a block by selecting one movement vector from among N predominant vectors, wherein the predominant vectors are the ones of the group of vectors belonging to the movement vector field for said current image and at least to the movement vector field for a preceding image corresponding to a movement between said preceding image and further preceding image" as recited in claim 1 of the present claimed invention.

In addition, if one were to combine the systems of Kerdranvrat and Lee, the combined system, similarly to the individual systems of Kerdranvrat and Lee, would not select a single movement vector from among two motion vector fields as recited in the present claimed invention. The combined system would not even take into account a movement vector field for a current image and a movement vector field for a preceding image in a single selection step to reassign vectors. Specifically, the combined system formed from Kerdranvrat and Lee would operate only to classify vectors between successive images. Therefore, it is respectfully submitted that the combined system, similarly to the individual systems of Kerdranvrat and Lee, would neither disclose nor suggest "a stage of reassignment of a vector to a block by selecting one movement vector **from among N predominant vectors**, wherein the predominant vectors are the ones of the group of vectors **belonging to** the movement vector field for said current image **and at least to** the movement vector field for a preceding image corresponding to a movement between said preceding image and further preceding image" as recited in claim 1 of the

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present invention. Consequently, it is respectfully requested that the rejection of claim 1 under 35 USC 103(a) be withdrawn.

Dependant claims 2-4, 7 and 10-11 are considered to be patentable based on their dependence on independent claim 1. Therefore, the arguments presented above with respect to claim 1 also applies to claims 2-4, 7 and 10-11. Consequently, it is respectfully requested that the rejection of claims 2-4, 7 and 10-11 under 35 USC 103(a) be withdrawn.

VIII CONCLUSION

Kerdranvrat alone or in combination with Lee neither discloses nor suggests the "a stage of reassignment of a vector to a block by selecting one movement vector from among N predominant vectors, wherein the predominant vectors are the ones of the group of vectors belonging to the movement vector field for said current image and at least to the movement vector field for a preceding image corresponding to a movement between said preceding image and further preceding image" as recited in claim 1 of the present claimed invention. Accordingly it is respectfully submitted that the rejection of Claims 1-4, 7 and 10-11 should be reversed.

Respectfully submitted,
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July 13, 2006

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APPENDIX I - LISTING OF THE CLAIMS

1. Method of movement estimation for a sequence of images including segmentation of a current video image into image blocks, movement estimation per image block between the current image and a previous image in order to obtain a movement vector field for said current image, a stage of reassignment of a vector to a block by selecting one movement vector from among N predominant vectors, wherein the predominant vectors are the ones of the group of vectors belonging to the movement vector field for said current image and at least to the movement vector field for a preceding image corresponding to a movement vector field between said preceding image and a further preceding image, the vectors being scaled according to the temporal distance to which they correspond.

2. Method according to Claim 1, wherein, for a predominant vector, second-order regional maxima are detected so as not to be taken into account during the selection of the other predominant vectors.

3. Method according to Claim 1, wherein the predominant vectors are selected in each of four directions.

4. Method according to Claim 1. wherein the selection of the reassigned vector is based on the value of a displaced frame difference (DFD).

5. Method according to Claim 4, wherein, if the DFDs associated with the N predominant vectors are greater than the DFD associated with the original vector, a zero vector is adopted.

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6. Method according to Claim 4, wherein, if the DFDs associated with the N predominant vectors are greater than the weighted DFD associated with the original vector, the original vector is kept.

7. Method according to Claim 1, wherein the selection of the reassigned vector is based on the calculation of the activity (spatial gradient) in the inter-image difference block (current block -estimated block).

8. Method according to Claim 7, wherein, if the activities corresponding to the N predominant vectors are greater than the activity corresponding to the original vector, the zero vector is adopted.

9. Method according to Claim 7, wherein, if the activities corresponding to the N predominant vectors are greater than the weighted activity corresponding to the original vector, the original vector is kept.

11. Method according to Claim 7, wherein the components of the vectors used during the spatial-gradient calculations are the spatially filtered components.

12. Method according to Claim 1, wherein the vectors of the preceding images, in addition to being scaled, are weighted as a function of the temporal distance.

13. Method according to Claim 1, wherein, when a break in movement is detected, the vectors of the preceding images are not considered.

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APPENDIX II - EVIDENCE

Applicant does not rely on any additional evidence other than the arguments submitted hereinabove.

APPENDIX III - RELATED PROCEEDINGS

Applicant respectfully submits that there are no proceedings related to this appeal in which any decisions were rendered.

APPENDIX IV - LIST OF REFERENCES

U.S. Patent	Issued Date	102(e) Date	Inventors
5,193,001	March 9, 1993		Kerdranvrat
6,317,460	November 13, 2001		Lee

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